P A T E N T

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
)
Kaye, et al.)
)
Application No.:)
)
Filed: Herewith)
)

For: PRE-PROCESSING OF BIT RATE ALLOCATION IN A MULTI-CHANNEL VIDEO ENCODER

CERTIFICATE OF MAILING

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By Michele Hollis
Michele Hollis

Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Prior to the calculation of the filing fee and examination of the above-referenced U.S. patent application, please amend the application as follows:

IN THE SPECIFICATION:

Page 1, between lines 2 and 3, insert the following new paragraph:

-- This application is a continuation of application no. 09/097,645, filed on June 16, 1998.--.

Replace the paragraph on Page 2, lines 1-9 with the paragraph set forth below. In accordance with 37 C.F.R. §1.121, the changes made to the specification are set forth on a separate sheet attached hereto.

--However, the conventional techniques have various drawbacks. For example, the use of successive feedback cycles in the compressor can be time-consuming and computationally intensive. Additionally, special bit rate needs for specific types of video scenes may not be considered. Moreover, the equalization of a quantization distortion measure does not reliably translate to an equalization of perceived image quality.--

IN THE CLAIMS:

Please cancel claims 1-24 without prejudice and insert the following new claims 25-92:

--25. (New) A method for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising the steps of:

processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof;

determining an initial bit rate demand for each current picture according to the associated spatial activity and temporal activity; and

for at least one current picture, determining whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof.

26. (New) A method in accordance with claim 25, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a scene change is detected for the current picture.

27. (New) A method in accordance with claim 25, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a fade is detected for the current picture.

28. (New) A method in accordance with claim 25, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a flash is detected for the current picture.

29. (New) A method in accordance with claim 25, comprising at least one of the further steps of, for at least one current picture:

adjusting the initial bit rate demand thereof upwards when the associated temporal activity exceeds an upper threshold; and

adjusting the initial bit rate demand thereof downwards when the associated temporal activity is less than a lower threshold.

30. (New) A method in accordance with claim 25, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof upwards when a quantization level of at least one previous picture associated therewith of a same picture type exceeds an upper threshold.

31. (New) A method in accordance with claim 25, comprising at least one of the further steps of, for at least one current picture:

adjusting the initial bit rate demand thereof downwards when a length of an associated group of pictures exceeds a nominal level; and

adjusting the initial bit rate demand thereof upwards when a length of an associated group of pictures is less than a nominal level.

32. (New) A method in accordance with claim 31, comprising the further step of, for the at least one current picture:

tempering the upwards or downward adjusting of the initial bit rate demand thereof when the temporal activity thereof exceeds an upper threshold.

33. (New) A method in accordance with claim 25, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof according to whether a horizontal pixel resolution thereof exceeds or is less than a nominal level.

34. (New) A method in accordance with claim 25, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof upwards when an associated brightness level is less than a lower threshold.

35. (New) A method in accordance with claim 25, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof according to a priority factor thereof which indicates a relative importance of the at least one current picture in the multiplexed data stream.

36. (New) An apparatus for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising:

means for processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof;

means for determining an initial bit rate demand for each current picture according to the associated spatial activity and temporal activity; and

means for determining, for at least one current picture, whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof.

37. (New) Apparatus in accordance with claim 36, further comprising:

means for adjusting said initial bit rate demand for each current picture according to whether a scene change is detected for the current picture.

38. (New) Apparatus in accordance with claim 36, further comprising:

means for adjusting said initial bit rate demand for each current picture according to whether a fade is detected for the current picture.

39. (New) Apparatus in accordance with claim 36, further comprising:

means for adjusting said initial bit rate demand for each current picture according to whether a flash is detected for the current picture.

40. (New) Apparatus in accordance with claim 36, wherein, for at least one current picture, the apparatus further comprises:

means for adjusting the initial bit rate demand thereof upwards when the associated temporal activity exceeds an upper threshold; and

means for adjusting the initial bit rate demand thereof downwards when the associated temporal activity is less than a lower threshold.

41. (New) Apparatus in accordance with claim 36, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof upwards when a quantization level of at least one previous picture associated therewith of a same picture type exceeds an upper threshold.

42. (New) Apparatus in accordance with claim 36, wherein, for at least one current picture, the apparatus further comprises:

means for adjusting the initial bit rate demand thereof downwards when a length of an associated group of pictures exceeds a nominal level; and

means for adjusting the initial bit rate demand thereof upwards when a length of an associated group of pictures is less than a nominal level.

43. (New) Apparatus in accordance with claim 42, wherein, for the at least one current picture, the apparatus further comprises:

means for tempering the upward or downward adjusting of the initial bit rate demand thereof when the temporal activity thereof exceeds an upper threshold.

44. (New) Apparatus in accordance with claim 36, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof according to whether a

horizontal pixel resolution thereof exceeds or is less than a nominal level.

45. (New) Apparatus in accordance with claim 36, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof upward when an associated brightness level is less than a lower threshold.

46. (New) Apparatus in accordance with claim 36, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof according to a priority factor thereof which indicates a relative importance of the at least one current picture in the multiplexed data stream.

47. (New) A method for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising the steps of:

processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof;

determining an initial bit rate demand for each current picture according to the associated spatial activity and temporal activity; and

for at least one current picture, adjusting the initial bit rate demand thereof upwards when an associated brightness level is less than a lower threshold.

48. (New) A method in accordance with claim 47, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a scene change is detected for the current picture.

49. (New) A method in accordance with claim 47, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a fade is detected for the current picture.

50. (New) A method in accordance with claim 47, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a flash is detected for the current picture.

51. (New) A method in accordance with claim 47, comprising the further step of:

for at least one current picture, determining whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity

thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof.

52. (New) A method in accordance with claim 47, comprising at least one of the further steps of, for at least one current picture:

adjusting the initial bit rate demand thereof upwards when the associated temporal activity exceeds an upper threshold; and

adjusting the initial bit rate demand thereof downwards when the associated temporal activity is less than a lower threshold.

53. (New) A method in accordance with claim 47, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof upwards when a quantization level of at least one previous picture associated therewith of a same picture type exceeds an upper threshold.

54. (New) A method in accordance with claim 47, comprising at least one of the further steps of, for at least one current picture:

adjusting the initial bit rate demand thereof downwards when a length of an associated group of pictures exceeds a nominal level; and

adjusting the initial bit rate demand thereof upwards when a length of an associated group of pictures is less than a nominal level.

55. (New) A method in accordance with claim 54, comprising the further step of, for the at least one current picture:

tempering the upwards or downward adjusting of the initial bit rate demand thereof when the temporal activity thereof exceeds an upper threshold.

56. (New) A method in accordance with claim 47, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof according to whether a horizontal pixel resolution thereof exceeds or is less than a nominal level.

57. (New) A method in accordance with claim 47, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof according to a priority factor thereof which indicates a relative importance of the at least one current picture in the multiplexed data stream.

58. (New) An apparatus for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising:

means for processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof;

means for determining an initial bit rate demand for each current picture according to the associated spatial activity and temporal activity; and

means for adjusting, for at least one current picture, the initial bit rate demand thereof upward when an associated brightness level is less than a lower threshold.

59. (New) Apparatus in accordance with claim 58, further comprising:

means for adjusting said initial bit rate demand for each current picture according to whether a scene change is detected for the current picture.

60. (New) Apparatus in accordance with claim 58, further comprising:

means for adjusting said initial bit rate demand for each current picture according to whether a fade is detected for the current picture.

61. (New) Apparatus in accordance with claim 58, further comprising:

means for adjusting said initial bit rate demand for each current picture according to whether a flash is detected for the current picture.

62. (New) Apparatus in accordance with claim 58, further comprising:

means for determining, for at least one current picture, whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof.

63. (New) Apparatus in accordance with claim 58, wherein, for at least one current picture, the apparatus further comprises:

means for adjusting the initial bit rate demand thereof upwards when the associated temporal activity exceeds an upper threshold; and

means for adjusting the initial bit rate demand thereof downwards when the associated temporal activity is less than a lower threshold.

64. (New) Apparatus in accordance with claim 58, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof upwards when a quantization level of at least one previous picture associated therewith of a same picture type exceeds an upper threshold.

65. (New) Apparatus in accordance with claim 58, wherein, for at least one current picture, the apparatus further comprises:

means for adjusting the initial bit rate demand thereof downwards when a length of an associated group of pictures exceeds a nominal level; and

means for adjusting the initial bit rate demand thereof upwards when a length of an associated group of pictures is less than a nominal level.

66. (New) Apparatus in accordance with claim 65, wherein, for the at least one current picture, the apparatus further comprises:

means for tempering the upward or downward adjusting of the initial bit rate demand thereof when the temporal activity thereof exceeds an upper threshold.

67. (New) Apparatus in accordance with claim 58, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof according to whether a horizontal pixel resolution thereof exceeds or is less than a nominal level.

68. (New) Apparatus in accordance with claim 58, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof according to a priority

factor thereof which indicates a relative importance of the at least one current picture in the multiplexed data stream.

69. (New) A method for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising the steps of:

processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof;

determining a bit rate demand for each current picture according to the associated spatial activity and temporal activity;

determining whether characteristics of the current pictures exist for adjusting the initial bit rate demand thereof, and if so, adjusting the initial bit rate demand;

determining an overall available bit rate for transmitting the current pictures in a multiplexed data stream;

determining, in an initial iteration, an initial allocated bit rate for each current picture according to a ratio of bit rate demand thereof to a sum of the bit rate demands from each current picture;

determining a bit rate surplus or deficit between the overall available bit rate and a sum of the initial allocated bit rates; and

adjusting, in at least one successive iteration, the initial allocated bit rate for at least some of the current

pictures according to the surplus or deficit, and a ratio of bit rate demand thereof to a sum of the bit rate demands thereof.

70. (New) A method in accordance with claim 69, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a scene change is detected for the current picture.

71. (New) A method in accordance with claim 69, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a fade is detected for the current picture.

72. (New) A method in accordance with claim 69, comprising the further step of:

adjusting said initial bit rate demand for each current picture according to whether a flash is detected for the current picture.

73. (New) A method in accordance with claim 69, comprising the further step of:

for at least one current picture, determining whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity

thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof.

74. (New) A method in accordance with claim 69, comprising at least one of the further steps of, for at least one current picture:

adjusting the initial bit rate demand thereof upwards when the associated temporal activity exceeds an upper threshold; and

adjusting the initial bit rate demand thereof downwards when the associated temporal activity is less than a lower threshold.

75. (New) A method in accordance with claim 69, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof upwards when a quantization level of at least one previous picture associated therewith of a same picture type exceeds an upper threshold.

76. (New) A method in accordance with claim 69, comprising at least one of the further steps of, for at least one current picture:

adjusting the initial bit rate demand thereof downwards when a length of an associated group of pictures exceeds a nominal level; and

adjusting the initial bit rate demand thereof upwards when a length of an associated group of pictures is less than a nominal level.

77. (New) A method in accordance with claim 76, comprising the further step of, for the at least one current picture:

tempering the upwards or downward adjusting of the initial bit rate demand thereof when the temporal activity thereof exceeds an upper threshold.

78. (New) A method in accordance with claim 69, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof according to whether a horizontal pixel resolution thereof exceeds or is less than a nominal level.

79. (New) A method in accordance with claim 69, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof upwards when an associated brightness level is less than a lower threshold.

80. (New) A method in accordance with claim 69, comprising the further step of:

for at least one current picture, adjusting the initial bit rate demand thereof according to a priority factor thereof which indicates a relative importance of the

at least one current picture in the multiplexed data stream.

81. (New) An apparatus for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising:

means for processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof;

means for determining a bit rate demand for each current picture according to the associated spatial activity and temporal activity;

means for determining whether characteristics of the current pictures exist for adjusting the initial bit rate demand thereof, and if so, adjusting the initial bit rate;

means for determining an overall available bit rate for transmitting the current pictures in a multiplexed data stream;

means for determining, in an initial iteration, an initial allocated bit rate for each current picture according to a ratio of bit rate demand thereof to a sum of the bit rate demands from each current picture;

determining a bit rate surplus or deficit between the overall available bit rate and a sum of the initial allocated bit rates; and

means for adjusting, in at least one successive iteration, the initial allocated bit rate for at least some of the current pictures according to the surplus or

deficit, and a ratio of bit rate demand thereof to a sum of the bit rate demands thereof.

82. (New) The apparatus of claim 81, further comprising:
means for adjusting said initial bit rate demand for each current picture according to whether a scene change is detected for the current picture.

83. (New) The apparatus of claim 81, further comprising:
means for adjusting said initial bit rate demand for each current picture according to whether a fade is detected for the current picture.

84. (New) The apparatus of claim 81, further comprising:
means for adjusting said initial bit rate demand for each current picture according to whether a flash is detected for the current picture.

85. (New) The apparatus of claim 81, further comprising:
means for determining, for at least one current picture, whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof.

86. (New) The apparatus of claim 81, wherein, for at least one current picture, the apparatus further comprises:

means for adjusting the initial bit rate demand thereof upwards when the associated temporal activity exceeds an upper threshold; and

means for adjusting the initial bit rate demand thereof downwards when the associated temporal activity is less than a lower threshold.

87. (New) The apparatus of claim 81, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof upwards when a quantization level of at least one previous picture associated therewith of a same picture type exceeds an upper threshold.

88. (New) The apparatus of claim 81, wherein, for at least one current picture, the apparatus further comprises:

means for adjusting the initial bit rate demand thereof downwards when a length of an associated group of pictures exceeds a nominal level; and

means for adjusting the initial bit rate demand thereof upwards when a length of an associated group of pictures is less than a nominal level.

89. (New) The apparatus of claim 88, wherein, for the at least one current picture, the apparatus further comprises:

means for tempering the upward or downward adjusting of the initial bit rate demand thereof when the temporal activity thereof exceeds an upper threshold.

90. (New) The apparatus of claim 81, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof according to whether a horizontal pixel resolution thereof exceeds or is less than a nominal level.

91. (New) The apparatus of claim 81, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof upward when an associated brightness level is less than a lower threshold.

92. (New) The apparatus of claim 81, further comprising:

means for adjusting, for at least one current picture, the initial bit rate demand thereof according to a priority factor thereof which indicates a relative importance of the at least one current picture in the multiplexed data stream.--

REMARKS

Summary

This Preliminary Amendment cancels claims 1-24 without prejudice, and substitutes new claims 25-92 therefor. Claims 25-92 contain subject matter previously found in claims 25-34 and 39-48 of Applicants' parent application, of which the present application is a continuation.

The Examiner allowed claims 35-38 and 49-52 of the parent application. Applicants' Amendment dated February 9, 2001 accepted these allowed claims and cancelled the rejected claims 25-34 and 39-48.

Claims 25-34 and 39-48 of the parent application were rejected under 35 U.S.C. § 103(a) as being unpatentable over Balakrishnan (US 5,793,425) in view of Linzer (US 6,038,256).

Relationship of New Claims 25-92 To
Claims 25-52 of the Parent Application

The following table provides the relationship between the new claims 25-92 and the claims of the parent application:

NEW CLAIM	CORRESPONDING ORIGINAL CLAIM(s)
25	25 and 27
26	26
27	26

28	26
29	28
30	29
31	30
32	31
33	32
34	33
35	34
36	39 and 41
37	40
38	40
39	40
40	42
41	43
42	44
43	45
44	46
45	47
46	48
47	25 and 33
48	26
49	26
50	26
51	27
52	28
53	29
54	30

55	31
56	32
57	34
58	39 and 47
59	40
60	40
61	40
62	41
63	42
64	43
65	44
66	45
67	46
68	48
69	25 and 35
70	26
71	26
72	26
73	27
74	28
75	29
76	30
77	31
78	32
79	33
80	34
81	39 and 49

82	40
83	40
84	40
85	41
86	42
87	43
88	44
89	45
90	46
91	47
92	48

Therefore, new claims 1-68 relate to the subject matter of rejected claims 25-34 and 39-48 of the parent application. New claims 69-92 are based on a combination of the subject matter of the allowed claims with the rejected claims 25-34 and 39-48 of the parent application. In particular, new claim 69 is a combination of claim 25 and allowed claim 35 of the parent application, and new claim 81 is a combination of claim 39 and allowed claim 49 of the parent application.

Discussion of Balakrishnan

Balakrishnan discloses a scheme for controlling the output channel rate and the target number of bits for each picture at encoders to equalize picture quality and avoid buffer overflows or underflows (Abstract). Moreover, in column 15, Balakrishnan refers to adjusting the bit rate for an encoder to avoid an encoder or decoder buffer overflow. The bit rate demand may be adjusted in accordance with the spatial and temporal activity of each picture (Col. 1, lines 50-59).

In contrast, Applicants' independent claims 25 and 36 set forth that an initial bit rate demand is determined for each current picture based on the picture's spatial activity and temporal activity. A determination is then made as to whether the spatial activity of a current picture is below a lower threshold, and if so, the associated temporal activity is increased and the initial bit rate demand of the picture is adjusted according to the increased temporal activity. The scheme disclosed in Balakrishnan for adjusting the bit rate to avoid a buffer overflow is ***not*** analogous to Applicant's technique of (i) determining whether the spatial activity of a current picture is below a lower threshold, (ii) increasing the associated temporal activity if the spatial activity is below the threshold, and (iii) adjusting the initial bit rate demand of the picture accordingly.

Applicants' scheme set forth in claims 25 and 36 of increasing the temporal activity of a picture when the spatial activity is below a lower threshold, and adjusting the initial bit rate demand accordingly, is performed because motion within a scene with a low spatial activity produces an artificially small inter-frame difference, which is the sum of the absolute differences of the luminance pixel values between the current and previous pictures (see, e.g., page 15, lines 17-21, and page 16, lines 4-8 of Applicants' specification). In other words, the frame-to-frame pixel difference may not always be an accurate estimate of temporal activity. For example, where two video scenes have the same temporal activity (as defined by the amount of motion in the scene), the scene with the higher spatial activity will generate a higher number for frame-to-frame pixel differences. To compensate for this effect, claims 25 and 36 provide for using the spatial activity to adjust the temporal activity as calculated by the frame-to-frame pixel difference (see, e.g., Applicants' page 16, lines 4-19). Such a solution would not have been obvious to one skilled in the art from the disclosure of Balakrishnan.

Balakrishnan does not disclose or remotely suggest the subject matter of Applicants' claims 25 and 36, wherein spatial activity is used to adjust the temporal activity in order to provide an adjusted bit rate demand.

Similarly, Balakrishnan does not disclose or remotely suggest the subject matter of Applicants' independent claims 47 and 58. These claims set forth a scheme of adjusting the initial bit rate demand of a picture upwards when an associated brightness level is less than a lower threshold. This is done since relatively dark scenes are generally not coded efficiently (see, e.g., page 19, lines 4-8 of Applicants' specification). Such a solution is not obvious, as intuitively a darker scene would appear to have less complexity than a bright scene. However, darker scenes actually require more bits for accurate encoding than a corresponding bright scene.

In addition, using brightness to adjust the bit rate demand is not analogous to using spatial activity to adjust bit rate demand. Brightness is defined as the average intensity of the pixel. Spatial activity is based on the variance among pixels in a single frame.

Balakrishnan does not disclose or remotely suggest the subject matter of Applicants' independent claims 47 and 58, in which brightness is used to adjust the initial bit rate demand of a picture.

Discussion of Linzer

Linzer discloses a statistical multiplexing system for combining a plurality of compressed video bit streams using pre-stored *a priori* statistics gathered on the inputted

video signals and *posteriori* statistics gathered during the actual (final) encoding of the video bit streams (Col. 4, lines 14-19). The *a priori* statistics may include inter-pixel differences within a picture or between pictures, statistics gathered from a preliminary encoding step (if performed) such as the number of bits generated for each compressed picture, repeat field pattern, average quantization level, scene change locations and picture types (Col. 4, lines 19-25).

Linzer does not cure the deficiencies of Balakrishnan. As discussed above in connection with Balakrishnan, Linzer does not disclose or remotely suggest the subject matter of Applicants' independent claims. In particular, Linzer does not disclose or remotely suggest the subject matter of Applicants' claims 25 and 36, where spatial activity is used to adjust the temporal activity in order to provide an adjusted bit rate demand.

Further, Linzer does not disclose or remotely suggest the subject matter of Applicants' independent claims 47 and 58, where brightness is used to adjust the initial bit rate demand of a picture.

Applicants respectfully disagree that the combination of Balakrishnan and Linzer would lead one of ordinary skill to the invention as claimed. At most, the combination of Balakrishnan and Linzer would lead one of ordinary skill in the art to adjust the initial bit rate demand based on temporal or spatial activity. However, there is simply no suggestion in such a combination of using spatial activity

to adjust the temporal activity in order to provide an adjusted bit rate demand, as in Applicants' claims 25 and 36. Similarly, there is no suggestion in such a combination of using brightness to adjust the initial bit rate demand, as in Applicants' claims 47 and 58.

Applicants respectfully submit that the present invention would not have been obvious to one skilled in the art in view of the combination of Balakrishnan and Linzer, or any of the other cited references, taken alone or in combination, or any of the other prior art of record.

Further remarks regarding the asserted relationship between Applicants' claims and the prior art are not deemed necessary, in view of the above discussion. Applicants' silence as to any of the Examiner's comments in the parent application is not indicative of an acquiescence to the stated grounds of rejection.

New claims 25-92 submitted herewith are therefore believed to be in immediate condition for allowance.

Conclusion

In view of the above, the Examiner is respectfully requested to allow each of presently pending claims 25-92 and to pass this application on to an early issue. If there are any remaining issues that need to be addressed in order to place this application into condition for allowance, the

Examiner is requested to telephone Applicants' undersigned attorney.

Respectfully submitted,

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Date: April 18, 2001

Version With Markings to Show Changes Made to Specification: Page 2, Lines 1-9.

However, the conventional techniques have various drawbacks. For example, the use of successive feedback cycles in the compressor can be time-consuming and computationally intensive. Additionally, special bit rate[s] needs for specific types of video scenes may not be considered. Moreover, the equalization of a quantization distortion measure does not reliably translate to an equalization of perceived image quality.